Are We Facing the Eradication of the Human Race?

An Alternative to antibiotics

by

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ABSTRACT

The use of sub-therapeutic antibiotics enhances growth in animals for food production, which leads to antibiotics becoming less effective for humans. In the market today, there is a variety of meat production to satisfy consumers’ demand to the increasing use of antibiotics that allows the industry to produce large quantities of meat rapidly. The purpose of this document is to make consumers aware of all the possible consequences of the overuse of antibiotics. Additionally, readers should understand that it’s not only the government’s responsibility to take an initiative in regulating sub therapeutic antibiotic use in farm animals. Consumer demand plays a vital role in the cycle of antibiotic use in the agricultural sector. This White Paper provides information from expert interviews in agriculture and through peer reviewed research articles to show consumers the significance of antibiotic resistance. Lastly, the intention is to demonstrate how the world can change the practice of overuse of antibiotics in farm animals.
INTRODUCTION

Many people perceive the antibiotic as a miracle remedy, but its use is effective only when necessary. Using antibiotics in excess over time makes bacteria resistant to the treatment, lessening the antibiotic’s potency. Antibiotics use in medicine is for fighting infections, while in agriculture their use is to make profit. Currently, administration of antibiotics to farm animals in the United States is rampant. Farmers administer antibiotics because it allows them to grow larger animals in a limited space giving them farmers greater earnings.

In the meat industry, there are two main practices of antibiotic usage. The first use is therapeutic, which treats sick animals. The second and more common use is sub-therapeutic, which increases animal growth rates. The main problem with sub-therapeutic use is it leads to bacteria becoming resistant and making antibiotics less effective in treating human and animal infection (therapeutic), such as food-borne illness.

Is there a better way for farmers to meet consumer demand without abusing antibiotics? How can the world become a part of the solution? The reader will see alternative methods that can be practiced instead of continual use of antibiotics as well as a call to action to establish a crucial agriculture system.
MARKET DRIVER

With the meat industry’s need to produce enough meat to meet consumer demand animals raised naturally cannot produce enough protein. Currently, a total of 8 billion tons of animal protein is produced annually, with the average American consuming 272.8 lbs. per year. This is where the use of sub-therapeutic antibiotics comes into play. The meat industry is using these drugs to grow animals at unnatural rates for greater food production, and thus they are able to meet the high quotas of protein demanded in the country and by the global market. This increase in supply has a direct and positive correlation to the meat industry’s’ profitability.

The continual use of antibiotics is rendering more bacteria to become resistant in human medicine. There are numerous scientific studies concluding that the use of antibiotics in human medicine gradually leads to antibiotic resistant. However, it has also been concluded that the overuse and misuse of antibiotics is accelerating resistance at a faster rate. Factory farmers rely on antibiotics and use them as a shortcut in an effort to raise their profit margins. This practice has become an area of major concern to many scientific and public health agencies that are striving to reduce the use of sub-therapeutic antibiotics in animals as growth promoters.

While many American farmers fear profit loss if they discontinue the use of growth promoting antibiotics, they can learn a lesson from Denmark. Denmark is one of the largest global pork producers worldwide. They have successfully banned antibiotics used in farm animals as growth promoters, without a significant loss of profit for factory farmers. According to the Pew Charitable
Trust, it was revealed that Denmark’s swine production has increased from 18.4 million in 1992 to 27.1 million in 2008. They also recorded a significant decrease in the amount of antibiotic resistant bacteria found in farm animals.

Consumer demand can be a powerful tool used to influence the types of meat available at your local grocery store. Seeking alternative products to those using sub-therapeutic antibiotics can save the lives of millions of individuals suffering from infections that cannot be treated due to antibiotic resistance. In the World Organization report, 14,000 people die to antibiotic-resistant bacteria each year. This does not include the 2 million-plus Americans that are simply infected; half of which are left waiting for a more powerful drug to be invented due to current strains of antibiotic resistance. Reducing the use of sub-therapeutic antibiotics would also thwart food borne illnesses from bacteria transmitted in human food. And this would ultimately reduce consumer spending on the cost of high medical care. Finding alternatives will greatly benefit both the American public and the meat industry as a whole. This practice could potentially establish a safe and stable agricultural system making the United State a role model for emerging industrial countries where rapid population growths mean an unending increase in the demand for meat.
For generations the meat industry has been relying on antibiotics to proliferate animal growth. The sudden removal of such sub-therapeutic antibiotics could potentially have a detrimental impact on the mortality rates in farm animals and boost production costs. The antibiotics are specifically used to help reduce mortality rates while boosting feed efficiency, creating large quantities of animals with high protein masses to be processed. Without the antibiotics, farmers would see profits fall due to increased expenditures on grain and time invested in aging animals to harvestable sizes. In a recent report published by the National Research Council, it was concluded that banning the use of antibiotics would result in an increased cost of 1.76% to poultry production and would drive up consumer price by $2.20 per person annually. This is a cost many consumers would be unhappy to incur.

Alternatively, the meat industry claims there is no clear evidence linking administered antibiotics to healthy farm animals for greater production and bacteria resistance in medicinal antibiotics for humans. “In fact, peer-reviewed studies suggest that over 95 percent of antibiotic resistance concerns in human medicine are unrelated to animal uses of antibiotics” quotes the National Pork Producer. In addition, the Journal of Antimicrobial Chemotherapy asserts that the removal of sub-therapeutic antibiotics from use may deteriorate animal health due to weight loss and increased mortality rates. Farmers would likely increase the usage of therapeutic antibiotics to counteract this effect.

Wildly diverse views in society from political institutions, the scientific community and consumers have turned this issue into a very controversial
debate. Lacking any sign of resolution this hot button topic truly challenges individuals from all walks of life and is waiting for an official government ruling to settle it. Until then, the divergent opinions will continue to persist causing lasting difficulty in promoting and educating awareness.

### PROBLEM AND CHALLENGE

Americans generally overlook the current meat industry practices of using sub-therapeutic antibiotics in livestock on a regular basis. This oversight has made it possible for farmers to rely, unchallenged, on sub-therapeutic antibiotics as a form of preventative disease control. Rather than administered to sickly animals on an individual basis of need, 74% of sub-therapeutic antibiotics are being administered to healthy animals through their feed and about 16% are being administered through livestock water sources (FDA).

A strong correlation is beginning to emerge, through various scientific studies, linking the negligent overuse of antibiotics in food animals and the loss of effectiveness of some human medicines. When bacteria are exposed to antibiotics, they face selective pressure causing them to develop an antibiotic resistance. The newly resistant bacteria then pass on their resistant genes to their offspring, creating a new strain of bacteria, at an exponential rate, that are impermeable to antibiotic control (Environmental Biology, 2002). “This process is a natural, unstoppable phenomenon exacerbated by the abuse, overuse and misuse of antimicrobials in the treatment of human illness and in animal husbandry, aquaculture and agriculture” (World Health Organization, 2000).
If left unchecked, the amount of bacteria becoming resistant to antibiotics at an unnatural rate will continue to soar far above current numbers. Presently, the negative impact has been widely felt across the medical field. New generations of bacteria are making human illnesses more severe, such as tuberculosis, which has become resistant to nine antibiotics in the last few decades. Something needs to be done to change this. However, there simply isn’t any legislation right now to prevent this accelerated evolution of bacteria from becoming more prevalent. Until the use of antibiotics in livestock is placed under government mandate, Americans’ health as well as populations receiving American meat exports will continue to suffer, for the sole purpose of having cheaper food.

Would you rather pay a few more cents on your meat or thousands of dollars for your medical care? In the long term, higher rates of antibiotic resistance cause the U.S government to spend more and more on health care. “The Institute of Medicine estimates the annual cost of infections caused by antibiotic-resistant bacteria to be U.S.$4 to $5 billion” (McGowan, 2001) Although, sub-therapeutic use of antibiotics help reduce the cost of our meals, but consumers don’t realize they end up paying more in the form of health care later on. It’s such an ironic situation that using sub therapeutic to promote faster growth in food animal, in expectation of profits and a running economy is actually resulting in ruining the economy because the U.S government must pay a lot more for the cost of hospitalization when people fall to drug resistance bacteria.
One of the consequences in antibiotic resistance that can be more of an issue than anything else is that there are no new classes of antibiotic in development. Currently, the antibiotic resistances of E.coli and salmonella strain are the main food poisonings bacteria, which many researchers reveal come with the overuse of drugs in food animal. “Bacterial resistance has now developed in all classes of antibiotics and the real problem is that no new class has been developed in the last 20 years,” Spokesman Richard Young said. This lead to a big decision making, European commission ban all growth promoter that was belong the same class as antibiotics that are used in treating diseases in human. (Dibner, Richard 2004).
HISTORICAL APPROACH

Penicillin was first invented in 1929 by Alexander Fleming, but it was not yet distributed widely until the 1940’s. During the Second World War, there was a massive production of penicillin that was produced by British pharmaceutical companies for the purpose of saving many soldiers from wounds and infection in battle. Post WWII, massive production of penicillin was made available to veterinarians for the treatment of bovine mantis in dairy animals (Gustafson, Bowen 1997). The use for therapeutic treatment also saw faster growth rates. In 1946, after seeking an inexpensive supplement for their livestock, American farmers turned to penicillin and saw significant weight gain in chickens. This practice was immediately recognized. Since then, the use of antibiotics for growth promoter in animals is distributed widely across the nation. This resulted in abusing the use of antibiotics that later was found that bacteria can resist the drug. Staphylococcus Aureus was found to be the first bacterium to fight off antibiotics. The bacterium causes illness such as toxic shock syndrome or pneumonia due to its overgrowth of toxins. This was the first case of antibiotic resistance as an alarm to people; however, American society still does not realize the consequence of the drug resistance. However with a real solution, many people may not have to suffer from bacterial-resistant infections.
CONCLUSION

There is a better way for livestock industry to meet consumer demand. Currently, there is no new development of antibiotics, but a new method for farmers to prevent contamination in farm animals’ intestinal tract. Antibiotics kills both good and bad bacterial but this new investigation makes many scientists get a better understanding of how other living organism can benefit from bacteria. Under pressure of antibiotic elimination from many public health agencies due to bacteria resistance, probiotic and prebiotic can be a new practice in farming. “An alternative approach to sub-therapeutic antibiotics in livestock is the use of probiotic microorganism, prebiotic substrates that enrich certain bacterial populations, or symbiotic combinations of prebiotics and probiotics.” (Patterson, Burkholder 2003) In a study from a Journal of Nutrition, researchers concluded prebiotic and probiotic are “a non-digestible food ingredient that beneficially affects the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon” (Gibson and Roberfroid, 1995). Prebiotic and Probiotic have tremendous benefits to animals and its microorganisms in digestive tract. These benefits included in animal performance enhancement, preventing pathogen colonization, decrease carcass contamination, to name a few. In addition, the use of prebiotics and probiotics will help preserve effectiveness of antibiotics in human medicine without causing a financial burden to all farmers global wide.
CALL TO ACTION

This is not the ending but it the beginning of change. People should not wait until it’s too late. It is the time for a positive change and this can happen successfully with many powerful strategies. A prevailing change starts at a grass roots level with intellectuals that can drive people’s mind. Consumers can help preserve the effectiveness of antibiotics in medicine for many generations to come by following a few guidelines:

- Buy meat products that were raised “without the use of antibiotics”
- Ask your local grocery store to supply antibiotic-free products as this will a demand for organically produced foods
- Educate people around you about the consequences of antibiotic resistance
- Use antibiotics only when necessary

Alternatives exist for the livestock industry. Because of the serious effect of antibiotic resistance, the industry should consider alternative animal production practices. Often time, minor changes in animal husbandry can greatly result in reduction antibiotics uses:

- Proper hygiene practices
- Ventilation improvement
- Late weaning
- Additional space for animals
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First published online: December 4, 2003


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